Do majority shareholder control deviation results in financial constraints?

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Igor Bernardi Sonza
Doutor em Finanças
Professor Titular de Administração da UFSM
E-mail: igorsonza@gmail.com

Alberto Granzotto
Doutor em Finanças PPGA/UFSM
E-mail: betorgufsm@gmail.com

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ABSTRACT

Purpose: This study aims to analyze how the moral hazard of the majority shareholder results in financial constrainsts for Brazilian companies listed on Brazil, Bolsa and Balcão (B3).
Method: we used the Ordinary Least Squares (OLS) to compare the cash flow sensitivity of cash for firms that have high control deviations control, presenting high moral hazard (constraints), with companies that have low control deviations, presenting low moral hazard (no restrictions).
Originality/Relevance: The originality of the research resides in the evidence that the deviation of shareholding control can be understood as a source of credit restriction, putting in check a particular and idiosyncratic source in emerging markets such as Brazil.
Results: our first result evidenced that, in historical terms, the control deviation declined significantly. On the other hand, the results reveal that the moral hazard of the majority shareholder, represented by the deviation of control, results in financial restrictions of Brazilian companies listed on B3.
Theoretical/methodological/practical contributions: the main implication of the research is to reveal idiosyncratic sources of credit in Brazil, since the majority shareholder control deviation (MSCD) reflects the weak legal protection for minority shareholders and creditors (civil law). This research helps capital market investors in countries with weak legal protections to choose companies that are concerned about governance issues, as well as companies to understand that such deviations can be harmful to corporate debt.

Keywords: control deviation, financial constraint, moral hazard.

O desvio de controle do acionista majoritário acarreta restrições financeiras?

RESUMO

Objetivo: este estudo tem como objetivo analisar como o risco moral do acionista majoritário acarreta restrição financeira para as empresas brasileiras listadas no Brasil, Bolsa e Balcão (B3).
Método: foi utilizado o Método dos mínimos quadrados ordinários para comparar a sensibilidade do caixa ao fluxo de caixa de empresas que possuem altos desvios de controle, apresentando alto risco moral (restrições), com empresas que possuem baixos desvios de controle, apresentando baixo risco moral (sem restrições).
Originalidade/Relevância: A originalidade da pesquisa reside na evidência de que o desvio de controle acionário pode ser entendido como uma fonte de restrição de crédito colocando em xeque uma fonte particular e idiossincrática em mercados emergentes como o Brasil.
Resultados: nosso primeiro resultado evidenciou que, em termos históricos, o desvio de controle decaiu significativamente. Por outro lado, os resultados revelam que o risco moral do acionista majoritário, representado pelo desvio de controle, induz restrições financeiras das empresas brasileiras listadas na B3.
Contribuições teóricas/metodológicas/práticas: a principal implicação da pesquisa é revelar fontes de crédito idiossincráticas no Brasil, uma vez que o desvio de controle do acionista majoritário (MSCD) reflete a fraca proteção legal para acionistas minoritários e credores (direito civil). Esta pesquisa auxilia investidores de mercado de capitais em países com proteção legal fraca a escolher

empresas que se preocupam com essas questões de governança, bem como empresas a entender que esses desvios podem ser prejudiciais à dívida corporativa.

Palavras-chave: desvio de controle, restrição financeira, risco moral.

1 INTRODUCTION

In recent years, financial researchers have introduced corporate governance mechanisms in the relationship between financial constraints and financial decisions, as can be seen in the study of Lin et al. (2011) and Luo et al. (2015), who sought explanations for variations in investment and cash holdings, from the perspective of financial constraints, financial development and investor protection.

As we will see throughout this research, the financial constraints can be explained at a fundamental level by the moral hazard and adverse selection. In its broadest scope, studies that relate aspects of governance to financial constraints are basically focused on the influence that financial development, as well as the degree of investor protection, has on financial constraints.

These notes are verified by Almeida et al. (2011), who claim that weak investor protection is a source of financial constraints, that is, lower levels of investor protection are related to higher external credit costs. Recently, this theoretical relationship was empirically evidenced by Lin et al. (2011), Luo et al. (2015) and Park et al. (2018), in which they reported that there is a relation between moral hazard of the majority shareholder and financial constraints.

In this context, the controlling shareholder expropriates outside investors by diverting the firm's resources for his own use, transferring assets and profits from companies, or committing funds to unprofitable projects that produce private benefits (Tirole, 2006). These problems of moral hazard are particularly serious when the controlling shareholder has control rights that far exceed his cash flow rights, as he is, then, able to divert corporate resources and to bear a smaller proportion of the financial consequences of such activities (Johnson, Boone, Breach, & Friedman, 2000; Lin, Ma, Malatesta, & Xuan, 2011a). This potential effect aggravates the agency problem between the controlling shareholder and minority shareholders. Dyck and Zingales (2004) suggest that the controlling shareholder's self-interested behavior lowers the value of all companies in which such behavior is possible, and such a behavior limits the ability of companies to fund attractive investment projects.

Thus, when investors' rights, such as shareholders' voting rights and creditors' recovery and liquidation rights, are extensive and well enforced by regulators or courts, investors are willing to finance companies because they are less fearful to know that there are corporate governance systems capable of circumventing such agency problems, given that markets and well-developed financial institutions help the company to overcome problems of moral hazard and adverse selection, thus reducing the cost of the company in raising external resources (La Porta et al., 2000).

In the Brazilian context governed by civil law, it is understood that corporate governance is embryonic, promoting inefficient regulation and weak legal protection for shareholders, allows the majority shareholder to increase its control and obtain private benefits at the expense of minority shareholders and creditors (La Porta et al., 1999; Shleifer & Vishny, 1997). In this view, the Brazilian scenario lacks efficient measures to protect investors, thus aggravating agency conflicts between the majority shareholder and credit sources, harming the raising of external resources (Lin et al., 2011; Luo et al., 2011; Luo et al., 2011; Luo et al., 2015). We used Brazil scenario and justified it because is one of the countries around the world that have one of the higher concentrated controlling shareholder which the main shareholder has, on average, 58,74% of the control rights, the three main shareholders have, on average, 80,41% and the five main shareholders have, on average, 84,73% (Sonza & Kloeckner, 2014).

After analyzing the literature research, we verify that there is no evidence for the relationship of the moral hazard of the controlling shareholder and financial constraints especially for a country with weak legal protection to investors as is the case of Brazil. Therefore, the present study aims to

analyze how the moral hazard of the majority shareholder result in financial constraints in Brazilian firms listed on B3. Specifically, the use of majority shareholder's control deviation (MSCD) as an explanatory factor of financial constraint (Lin et al., 2011; Luo et al., 2015; Park et al., 2018).

For this, using the Ordinary Least Squares (OLS), we compared the cash flow sensitivity of cash for firms that have high moral hazard of controlling shareholder, with firms that have low moral hazard of controlling shareholder. This intergroup comparison was based on the classic reference by Almeida et al. (2004), who showed that financial constraint firms have positive and significant cash flow sensitivity of cash, while unconstrained firms do not. Then, we are going to test if companies with high moral hazard of the controlling shareholder have positive and significant cash flow sensitivity of cash (hypothesis).

Like Luo et al. (2015) and Park et al. (2018), the present study innovates in proposing that the moral hazard of controlling shareholder represents the state of nature of financial constraint, because, as justified in the following section, firms that have high moral hazard of controlling shareholder are more prone to expropriation of minority shareholders and creditors, characterizing a high propensity do consume private benefits and, therefore, greater propensity to financial constraints (Tirole, 2006, Almeida & Wolfenson, 2006; Luo et al., 2015).

So, the present research contributes to the studies on the financial consequences of the moral hazard of the controlling shareholder bringing the argument that the moral hazard problem leads to financing constraints in the Brazilian scenario. In this context, this study provides evidence on how firm's financially constrained are affected by different moral hazard levels. This is possible because we used the moral hazard of controlling shareholder like a proxy, ex ante, to identify expected propensity of financial constraints. This is an innovation of our study, differing of the literature that use always the same proxies like size, rating, k-index and others possible variables. We think that using moral hazard of controlling shareholder like our proxy of expected propensity of financial constraints we reflect the Brazilian scenario on this classification aggregating value on the analysis.

Second, to examine Brazil evidence on firms' moral hazard of controlling shareholder and financial constraints, we used a long and actual period from 1996 to 2020 (24 years). Lin et al. (2011), Luo et al. (2015) and Park et al. (2018) use periods between 1994 to 2002, 2003 to 2009 and 1982 to 2009, respectively. This actual consideration is important because, we can observe how the control ownership of the majority shareholder evolved over time and understand how this can be related with our findings.

Third, Lin et al. (2011) and Park et al. (2018) have further considered the effect of control ownership structures on firm-level investment, which provided divergent conclusions how we discuss on the literature review. We think that this divergence is from the decision of investment when used to test financial constraints. Then, we do not used the investment decision, but the cash holdings decisions, in which it has more support from the financial constraints. Lastly, to test the relation between moral hazard of controlling shareholder and financial constraints, we think that the Brazilian scenario is optimal given their idiosyncrasies that was commented above. Then, this is the first paper that aim to test this relation on Brazil.

Our first result is from the descriptive statistics. We identified that, in historical terms, the control deviation declined significantly and, probably, some reasons to that is the effects of the changes promoted by Law nº 10,303/2001 (i.e., maximum proportion of common and preferred shares from two thirds to 50%) and the implementation of corporate governance levels at Brasil, Bolsa and Balcão, which took place from 2002 onwards (i.e. control deviation equal zero to the 'Novo Mercado'). This result implies that the government and the Securities and Exchange Commission (CVM) have sought legal mechanisms to increase investor confidence in companies, that is, mechanisms to protect them.

Henceforth looking at the regressions, a different behavior was evidenced between firms that have high MSCD (constrained) in relation to firms that have low (unconstrained), that is, that moral hazard of the majority shareholder influences the groups differently. Specifically, the firms with high moral hazard showed a positive significance in cash flow sensitivity of cash (expected for firms financially constrained), that is, increases in cash flow positively and significantly impact the cash policy of firms that have high moral hazard arising from the high MSCD (both at *t* and *t -1*). Alternatively, the second one firms (unconstrained) demonstrated that there is not a cash flow sensitivity of cash (both at *t* and *t -1*).

Thus, in short, the results reveal that the moral hazard of the majority shareholder, result in financial constraints in Brazilian firms listed in B3. The main justification for this finding is that, due to the excess of the majority shareholder's controlling rights, agency conflicts between credit sources are aggravated, given a negative signal that their assets may be expropriated, resulting in financial constraints (Luo et al. 2015, Park et al., 2018).

The financial constraints caused by the moral hazard of the controlling shareholder has a real and important impact on the access of external sources of credit, which implies the Brazil government need to aim at developing the capital market and enhancing corporate governance and, hence, reducing the controlling shareholder's expropriation activities. Like we discuss on the conclusion of this paper, some mechanisms already is working, but still is necessary more politics to develop the financial markets.

2 MORAL HAZARD OF THE MAJORITY SHAREHOLDER AND FINANCIAL CONSTRAINTS

In an imperfect capital market, information asymmetries, as described in Fazzari, Hubbard and Petersen (1988), lead to financial constraints for firms, as they pose a greater risk to investors and creditors who do not have sufficient information regarding the quality of the investment. This view, previously developed by Myers and Majluf (1984), alleges that, with asymmetric information, internal agents have an informational advantage, regarding the firm's prospects, over other stakeholders. Due to this fact, the more one of the parties in the transaction knows or knows about a relevant material fact that the other party is unaware of, the greater the asymmetries of information between firms and the market, and consequently, the greater the cost of raising external funds (Stiglitz et al., 1981).

Thus, debates on financial constraints have their main focus on pointing out that, due to asymmetries in information, firms may encounter difficulties in raising external funds (Myers & Majluf, 1984). According to this view, financial decisions (investment, cash retention, dividends and external financing) may depend on financial factors such as the availability of internal financing, access to new debt or equity financing, or the functioning of specific credit markets. (Fazzari et al., 1988; Dasgupta et al., 2011).

According to Fazzari et al. (1988), one of the consequences of information asymmetries in the fundraising process is the creation of a dissimilarity between the external and internal resources. Thus, due to this dissimilarity, investment decisions, cash holdings, dividends and external financing are affected (Almeida et al., 2004; Almeida et al., 2011; Fazzari et al., 1988). Consequently, in a context of financial constraints, financial decisions can be sensitive to the availability of cash flow, justified by the fact that marginal increases in the availability of cash flow (internal funds) can relax adverse states of nature (Fazzari et al., 1988).

Generally, the main debates on financial constraints refer to the cash flow sensitivity of investment (Fazzari et al., 1988; Kaplan & Zingales, 1997) and the cash flow sensitivity of cash (Almeida et al., 2004). However, recent studies have introduced corporate governance mechanisms to analyze investment issues and also cash holdings, since good corporate governance practices influence such decisions, especially in contexts of financial constraints. Furthermore, Almeida, Campello, and Weisbach (2004) model a firm's demand for liquidity by using the cash flow sensitivity of cash as an indicator of financing constraints, and this methodology is now widely used (Acharya, Almeida, & Campello, 2007; Khurana, Martin, & Pereira, 2006).

The use of cash flow sensitivities of cash to test for financial constraints avoids some of the problems associated with the investment cash flow literature. According to Almeida et al. (pg. 2, 2004) the main reason to this is that cash is a financial (as opposed to a real) variable, it is difficult to argue that the explanatory power of cash flows over cash holdings could be ascribed to its ability to forecast future business conditions (investment demand). Like we said on the introduction, Brazilian context is prevalent the legal origin established by civil law, on what it is understood that corporate governance is embryonic, promoting inefficient regulation and weak legal protection for shareholders, and, consequently, allows the majority shareholder to increase its control and obtain private benefits at the expense of minority shareholders and creditors (La Porta et al., 1999; Shleifer & Vishny, 1997). In this

view, the Brazilian scenario lacks efficient measures to protect investors, thus aggravating agency conflicts between the majority shareholder and credit sources, harming the raising of external resources (Lin et al., 2011; Luo et al., 2015).

For La Porta et al. (1999) and Shleifer and Vishny (1997), weak legal protection, combined with concentrated ownership and the inclusion of majority shareholders in the management of firms, would lead to the creation of mechanisms for the 'one share, one vote' rule be diverted, generating the control deviation. According to Claessens et al. (2000), the private benefits, as well as the divergence of interests between the majority shareholder and the credit providers, are even greater in cases where the majority shareholder has control rights greater than the firm's cash flow rights (control deviation).

Thus, the concentration of control results in incentives to expropriate minority shareholders, while the concentration of ownership incentives monitoring. According to Silveira et al. (2004), the expropriation occurs because of this situation, generating a combination of high power (i.e. concentration of control) with low allocation of their own resources in the company (i.e. low cash flow rights), reducing the benefits of having a majority shareholder and increasing the expropriation of credit sources. Alternatively, according to La Porta et al. (1999), majority shareholders face strong incentives to monitor managers and maximize profits when they retain substantial cash flow rights in addition to control rights.

Therefore, the majority shareholder can exercise effective control over the company with a relatively low proportion of cash flow rights and, consequently, have the incentives and ability to use corporate resources for their particular benefit (Claessens et al., 2000). These factors, taken together, decrease investors' willingness to provide resources and increase the costs associated with external financing and the guarantees required for granting loans.

In this sense, recently, the moral hazard of the majority shareholder, represented by its control deviation, has drawn attention when seeking to explain the phenomenon of financial constraints, mainly by the prediction that such moral hazard arising from the majority shareholder, intensifying the difference between the cost of external and internal financing (Lin et al., 2011; Luo et al. 2015; Park et al., 2018). This difference originates from the possibility of extracting private benefits, as it generates a greater propensity for expropriation of wealth by the majority shareholders in relation to sources of credit, managing to influence a large part of business decisions (Almeida & Wolfenson, 2006; Claessens et al., 2000).

In this context, second Luo et al. (2015), when the financially constrained firms try to to issue equity to finance their investment opportunities, the investors consider the possible influence and the expected expropriation arising from the moral hazard of the controlling shareholder and, consequently, these investors demand a higher risk premium. Theoretically, then, the firms cannot fund all desired investments and, hence, the moral hazard problem caused by the controlling shareholder with excess control rights generates a positive and significant cash flow sensitivity of investment/cash (Luo et al. 2015, Park et al. 2018).

Nonetheless, empirically, on the same way that the traditional literature on financial constraints, the studies that link the moral hazard of the controlling shareholder to financial constraints there is no consensus on whether the positive cash flow sensitivity of investment reflects a behavior of financially constrained companies, making the results inconclusive. Therefore, when we talk about the investment decision, the same divergence of results observed in the traditional literature is observed in the literature on moral hazard of controlling shareholder and financial constraint (e.g. Fazzari et al. 1988; Kaplan & Zingales, 1997).

In other words, some surveys have shown a positive cash flow sensitivity of investment for companies that have higher levels of control rights, while others have shown a negative sensitivity, as specified below. In specific, Lin et al. (2011) demonstrated that ownership and control structure are important determinants of financial constraints. The authors examined the impact of control deviation in financially constrained North American firms from 1994 to 2002 and found that the cost of raising external funds is significantly higher for firms that have high control deviation, suggesting that it increases the financial constraints, being justified by the increase in the possibility of expropriation of minority shareholders and creditors.

In the same way, Lin, Ma, Malatesta, and Xuan (2011a) adopt a structural approach to explore the relationship between the excess control rights of the controlling shareholder and financing constraints by estimating an Euler equation of a standard intertemporal investment model. The authors found that the shadow value of external funds is significantly higher for companies with greater insider control–ownership divergence. Another possible explanation for this result is founded in Lin, Ma, and Xuan (2011b) that justified that the moral hazard of the controlling shareholder may increase the monitoring costs and credit risk faced by banks and, in turn, increase the company's cost of debt financing.

Therefore, in general, these studies showed that the moral hazard of the majority shareholder result in financing constraints. Thus, as firms that have high moral hazard of controlling shareholder seek to capture external resources to realize valuable investment opportunities, potential capital holders take into account it, influencing the dissimilarity between external and internal financing, reflecting in the investment policy making it sensible to increases in cash flow (Almeida & Wolfenson, 2006; Lin et al. 2011).

Alternatively, Park et al. (2018) examine the effect of controlling shareholders' ownership of firms on the firms' financial constraints in 22 economies for the 1982-2009 period and found that the overinvestment propensity of controlling shareholders becomes less severe with an increase in cash-flow rights. In others words, it indicates that a higher deviation between the control rights and cash-flow rights of controlling shareholders lower their overinvestment propensity, thereby lowering the firm's financial constraints.

Park et al. (2018) suggest that a higher protective legal environment for minority shareholders blocks the entrenchment of controlling shareholders and thus benefitting the firm with slackened financing constraints in the given legal origin. In other words, the authors found that firms that have high control deviation have lower cash flow sensitivity of investment, then, less financial constraints. Park et al. (2018) suggested that large shareholders can alleviate the agency problem because they have strong incentives to maximize the value of their shareholdings, known as enhancement effect or positive incentive effect.

On the other hand, given this divergence on the results, recent studies are using the cash flow sensitivity of cash to test the relation between the moral hazard of controlling shareholder and the financial constraints, showing that the control deviation of shareholders influences the firms' cash holdings (Kuan, Li and Liu, 2012). The intuition behind this idea is that since external investors anticipate the expropriation and discount the terms at which they are willing to provide financing, the controlling shareholder is likely to use internal funds to build cash holdings and such a cash holding decision is in the interest of the controlling shareholder. Hence, firms that face more serious moral hazard problems may save more cash out of cash flows. As a result, these firms have higher cash flow sensitivity of cash.

The main study that demonstrated this relation was Luo et al. (2015) that using a sample of Chinese companies listed during the period 2003-2009, identified that control deviation reduces the ability of firms to access external financing, making their cash flow sensitivity of cash positive and significant. Thus, according to Luo et al. (2015), firms that face more serious agency problems may retain larger amounts of cash flow. As a result, these companies are more cash flow sensitivity of cash.

Complementary, the authors analyze how the moral hazard of the controlling shareholder affects firms' ex ante cost of equity and found that the cost of equity is significantly higher for firms with a greater divergence between the controlling shareholder's control and cash flow rights confirming that the hypothesis that the cost of equity is positively related to the agency problem between the controlling shareholder and minority shareholders.

Based on these assumptions, the following hypotheses are formulated, based on studies by Almeida et al. (2004), Lin et al. (2011), Luo et al. (2015) and Park et al. (2018):

Hypothesis 1 (H1): the presence of a majority shareholder with a high moral hazard has a positive and significant cash flow sensitivity of cash characterizing the financial constraints.

3 METHODOLOGICAL PROCEDURES

To achieve the proposed objective, the methodological procedures is divided into two parts, as follows: (i) sample and data collection; (ii) econometric model; (iii) variable description.

3.1 Sample and data collection

The sample includes all Brazilian firms traded on B3, comprising the period available from 1996 to 2020. Data referring to income statements, cash flow and balance sheet were collected mainly by Economática and, in the background, data were collected from the website of the Brazilian Security Exchange Commission (CVM). The variable 'Acquisitions', was carried out through Capital IQ. All accounting variables were indexed by the General Price Index (IPCA), with the year 2020 as the focal point.

After collection, the data went through a conference to verify that there were no problems in the collection process. Thus, for the purpose of composing the final sample and refining the data, some selection criteria were applied, based on Almeida et al. (2004), excluding from the sample observations that contained: (i) cash holdings greater than the total value of assets; (ii) sales growth greater than 100%; (iii) Tobin's Q negative or greater than 10; (iv) Fund Sector and Financial Sector; and, (v) negative sales. Finally, to reduce the effects resulting from the presence of extreme values, the variables were winsorized at 1% in both tails (1% and 99%). The final study sample consisted of 2,720 observations from 444 firms (unbalanced panel).

3.2 Econometric model

There are major impasses in the definition what characterizes a financial constraint, as seen in Almeida et al. (2004), Fazzari et al. (1988), Kaplan and Zingales (1997), among others. Thus, the difficulty in identifying financial constraints resides in the fact that there is no single criterion previously defined to verify their presence and, in the fact, that this variable is not directly observable. The spectrum of possible measures for classification is wide. To classify firms into financially constrained and unconstrained, Luo et al. (2015) indicate that the best way would be to identify common aspects among companies, such as the classic measures of dividend payment, credit rating, size and KZ-Index.

For the most part, the classic measures suffered criticism throughout their applications, revealing that only a theoretical justification is not enough to define the state of credit constraint. Some studies support this argument, such as the Brav, Graham, Harvey and Michaely (2005) survey, which showed that managers preferred to suspend investments with positive NPV and even seek financing instead of suspending dividend payments. This result contradicts the initial proposition of Fazzari et al. (1988) that financial restrictions could be observed by paying dividends.

Another research that questioned the need for advances in the credit constraint literature was the research by Farre-Mensa and Ljungqvist (2016), in which they showed that none of the financial measures based on the KZ-Index, Rating and dividends are capable of to identify companies that face financial constraints, as the behavior of firms classified as constrained does not differ substantially from firms classified as unconstrained in their tests. Thus, the authors suggest that existing findings that have been attributed to credit constraints may instead reflect differences in firms' growth and financing policies at different stages of their life cycles (Farre-Mensa and Ljungqvist, 2016).

The purpose of carrying out this brief discussion is to highlight the importance of analyzing the financial restriction measures and if these really capture the difficulties of the firms in seeking

external capital as well as whether the credit restriction measure reflects macroeconomic aspects, financial development, corporate governance and idiosyncratic factors of the research application locus. Unlike these studies and as mentioned, the present study seeks to explain financial constraints through the agency conflict between the majority shareholder and credit sources, in which, as proposed by Luo et al. (2015), financial constraints may be a consequence of the majority shareholder's moral hazard, reflected by its control deviation (Lin et al., 2011).

In this context, the use of the MSCD as a way of classifying financial constraints differs from the classic forms mentioned above, contributing to advances in research involving financial constraints exceptionally for the Brazilian context, since, until then, it is not known the existence of such use, which may reveal new types of sources of financial constraints.

Initially, it was necessary to measure the MSCD. For this, we followed the methodology of Claessens et al. (2000) and Luo et al. (2015), which calculate this variable through the difference between the majority shareholder control rights (MSCR) and the majority shareholder ownership rights (ORMS). The definition of these variables is evidenced in Table 1. In order to exemplify this calculation, two companies were randomly chosen from the sample. The first firm has 63.46% of MSCR and 63.46% of MSOR, generating a MSCD of null control. The second company has 99.58% of MSCR and only 56.97% of MSOR, generating MSCD of 42.61% (99.58% - 56.97%).

The second step was to separate the sample into firms that have high MSCD, characterizing high moral hazard of the controlling shareholder. Following the literature we used the extremes of the distribution of the MSCD to better capture these differences, as used in classic variables (size, KZ-Index, dividends, among others), that is, the three upper deciles of the MSCD to characterize firms with high moral hazard and the three lower deciles to characterize firms withlow moral hazard. Based on this question, the upper threshold was 15.64% of the MSCD. Furthermore, the lower threshold was 0%.

Through these thresholds, the first exemplified firm would be classified as a firm with low moral hazard, because its MSCD is null, and, consequently, it's expected a behavior of unconstrained firm. Now the second firm would be classified as a firm with high moral hazard since its MSCD is higher than the threshold of the upper deciles (i.e., 42.61% > 15.64%), and, consequently it's expected a behavior of constrained firm. Whit this subdivision is possible to test hypotheses H1, following the empirical model of Equation (1), based on literature (Almeida et al., 2004); Lin et al., 2011; Luo et al., 2015).

$$\frac{\Delta Cash_{i,t}}{TA_{i,t}} = \beta_1 + \beta_2 CF_{i,t} + \sum_{t=1}^{n} \beta_3 Cont_{i,t} + \sum_{i=1}^{12} \beta_4 IFE_i + \sum_{t=1}^{27} \beta_5 TFE_t + \varepsilon_{i,t} \quad (1)$$

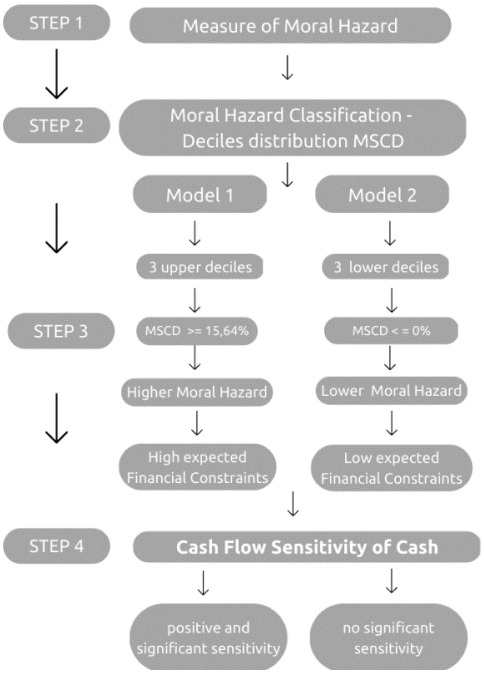
where, $\frac{\Delta Cash_{i,t}}{TA_{i,t}}$, represents the ratio between the cash holdings variation and the total assets.

The coefficients, in their sequential order, represent: linear (β_1), operating cash flow (β_2); the set of *k* control variables that potentially affect the use of cash (β_3); dummies for Industrial Fixed Effects (β_4) and dummies for Temporary Fixed Effects between 1996 and 2020 (β_5). These variables are described in detail in Table 1.

Specifically, the most relevant independent variable is the cash flow, as it will reveal the behavior for the cash flow sensitivity of cash. Thus, for firms that have high MSCD (restricted), a positive and significant relationship is expected ($\beta_2 > 0$). This relationship follows Almeida et al. (2004), as the effect of the financial constraint can be captured by variations in cash flow, as constrained firms accumulate cash in anticipation of financial constraints. It's important to emphasize that we are going to estimate two models in which the first is the model that is going to test the sensitivity cash flow of cash to firms that have high MSCD (moral hazard) and the second model is to test the sensitivity cash flow of cash to firms that low MSCD.

The figure below shows the step-by-step of the methodological procedures.

igure 1
Steps methodological procedures



Source: Authors (2022)

3.3 Variable description

- Moral Hazard – control deviation

Control deviation occurs when voting shares are proportionately greater than shares entitled to participate in cash flows. Thus, excess control indicates the difference between the proportion of shares with voting rights and the total proportion of shares held by the majority shareholder (Konrath et al., 2016). Therefore, the shareholder holds αc% of the control structure and αp% of the ownership structure, when αc% ≠ αp%, there is a control deviation.

- Dependent variable –cash holdings variation

According to Dutra et al., (2018), the literature on cash holding employs several alternative definitions to verify companies' cash retention. Almeida et al., (2004) and Luo et al., (2015) use the change in cash and equivalents for total assets.

- Main independent variable – cash flow

Almeida et al. (2004) pointed out that in the presence of financial constraints, firms must present a positive cash flow sensitivity of cash. In the absence of financial constraints, systematic patterns in cash holdings are not expected, because changes in cash availability for unconstrained firms should not depend on either current cash flows or future investment opportunities.

- Control variables

The specifications in equation 1 assume that the control variables capture firm-specific, time effects, this means that part of the change in cash retention is not explained solely by cash flow shocks. Among the variables are: i) Capital Expenditures: Cash holdings is controlled by investment

expenditures on property, plant and equipament (PP&E) assets because firms can reduce cash reserves in a given year in order to finance their investment opportunities (Almeida et al., 2004); ii) Size – Natural Logarithm of Total Assets: due to the existence of economies of scale in cash policies, it is used as a proxy for the scale of the firm's operations, positively impacting cash holdings (Almeida et al., 2004); iii) Short-term onerous financing or Short-term onerous financing variation: firms with a high level of onerous short-term debt may choose to pay it instead of retaining cash (Almeida et al., 2004); iv) Tobin's Q: the inclusion of this variable seeks to control investment opportunities, as firms are prone to retain more cash when there are expectations of future investment projects (Acharya, Almeida and Campello, 2007); v) Net working capital: comprises assets that replace cash, and may reduce it (Almeida et al. 2004); and, vi) Cash Acquisitions: firms can reduce cash reserves in a given year, with acquisition expenses as these only reflect cash outflows (Almeida et al., 2004).

We sought to control the variation in cash retention for the variables mentioned in order to preserve the relationships exposed by Almeida et al. (2004) when testing cash sensitivity to cash flow and also because they are the main determinants of cash policy.

Table 1
Variables

Financial Constraint Measure				
Variable	**Description**		**Authors**	
Moral Hazard - Majority Shareholder's Control Deviation (MSCD)	$MSCD_{i,t}$ = Difference between the majority shareholder control rights ($MSCR_{i,t}$) and its ownership rights ($MSOR_{i,t}$) $MSCD_{i,t}$= $MSCR_{i,t}$-$MSOR_{i,t}$		Claessens et al. (2000), Lin et al. (2011), La Porta et al. (2002), Luo et al. (2015) Park et al. (2018)	
Dependent Variable				
	Description		**Authors**	
Cash Holdings Variation	$\Delta Cx_{i,t}$= $\frac{Cash_{i,t}-Cash_{i,t-1}}{Total\ Assets_{i,t}}$		Almeida et al. (2004), Luo et al. (2015)	
Independet Variables				
Variable	**Description**	**Authors**	**Signal**	
			Constrained	**Unconstrained**
Cash Flow	$\frac{CF_{i,t}}{Total\ Assets_{i,t}} = \frac{net\ profit_{i,t} + (depreciation_{i,t} + amortization_{i,t})}{Total\ Assets_{i,t}}$	Almeida et al. (2004), Lin et al. (2011), Luo et al. (2015)	+	No one relation
Tobin's Q	$Q_{i,t} = \frac{Market\ Value_{i,t}}{Total\ Assets_{i,t}}$	Luo et al. (2015)	-	-
Capital Expenditures	$CAPEX_{i,t} = \frac{Investiments_{i,t}}{Total\ Assets_{i,t}}$	Almeida et al. (2004), Fazzari et al. (1988)	-	-
Total Asset Logarithm	$TA(L)_{i,t}$= ln $(Total\ Assets_{i,t})$	Almeida et al. (2004), Luo et al. (2015)	+	+
Short-Term Onerous Debt	$FINCP_{i,t}\frac{STOD_{i,t}}{Total\ Assets_{i,t}}$ ou $\Delta STD_{i,t}\frac{(STOD_{i,t}-STOD_{i,t-1})}{Total\ Assetsl_{i,t}}$	Almeida et al. (2004), Dasgupta et al. (2011)	-	-
Net Working Capital	$\Delta NWC_{i,t} = \frac{(CA_{i,t}+CL_{i,t}+CA_{i,t})-(CA_{i,t-1}+CL_{i,t-1}+CA_{i,t-1})}{Total\ Assets_{i,t}}$ = in that: CA = Currents Assets; CL = Current Liabilities; CA = cash holding	Almeida et al. (2004)	-	-
Acquisitions	$AQUI_{i,t} = \frac{Aquisitions_{i,t}}{Total\ Assets_{i,t}}$.	Almeida et al. (2004)	-	-

Source: Elaborated by the authors (2022).

For unconstrained firms, we expected that there is not cash flow sensitivity of cash, since, according to Almeida et al. (2004), if a firm is not hired, there is no need to save cash for investment. In order to estimate Equation (1), we used the Ordinary Least Squares (OLS) method. This model was specified through model specification tests, so we initially tested the best specification between the pooled model and the fixed effects model, in which the Chow test indicated a better specification for the fixed effects model. Afterwards, we tested the best specification between the pooled model and the random effects model, in which the Breusch test indicated a better specification for the random effects model. Finally, therefore, we tested the best specification between the fixed effects and random effects models, in which the Hausman test indicated a better specification for the fixed effects model. Also, for the robustness checks, some tests are applied, as follows: (i) Variance Inflation Factor (VIF); (ii) Homoscedasticity (Breusch-Pagan, 1979); (iii) Serial-autocorrelation (Wooldridge); (iv) Normality (Mardia, Kent e Bibby, 1979); (v) Hausman and Mundlack test; and (vi) Endogeneity (Durbin-Wu-Husman).

4 RESULTS ANALYSIS

The following section is divided into two parts, as follows: (i) Correlation and Descriptive Statistics; and, (ii) Influence of the MSCD on financial constraints and robustness of results.

4.1 Descriptive statistics and correlation

Initially, we estimated the descriptive statistics and the evolution of our main variables. In general, one can see both a high concentration of control and ownership held by the majority shareholder, as well as the departure from the "rule, one share, one vote", that is, the presence of a shareholder deviation from the Brazilian reality. The voting rights of the majority shareholder reach, on average 61.34% while their rights over cash flows reach, on average 48.99% and, consequently, the divergence between control rights in relation to property rights reaches 10.96% (difference between the control structure in relation to the ownership structure Control deviation. In other words, the right of control of the main controlling shareholder of Brazilian companies exceeds the right of ownership, on average 10.96%

This fact converges with what was pointed out in the review that the weak legal protection for minority shareholders combined with a concentrated ownership with the insertion of large shareholders in the firm's management, causing the creation of mechanisms so that the rule 'one share one vote' was deviated

In historical terms, we identified that the divergence between control rights in relation to ownership rights declined significantly over the historical series. According to the analyses, the control deviation of the main controlling shareholder reaches its historical maximum in 1996 with a deviation of 22.21% and the historical minimum in 2015 with a deviation of 6.93%. The comparison between the first (e.g., 1996) and the last year (e.g., 2021) of the analysis shows that the shareholding deviation of the main shareholder declined, on average 14.86% being the decrease in control rights (10.25%) responsible for approximately 70% of the fall in control deviation and the increase in property rights (4.63%) are responsible for the remaining 30% of the fall in stock deviation.

These results indicate that there is a decrease in control deviation, corroborating with the note by Peixoto and Buccini (2013). These authors point out that the mentioned drop is basically justified by three main factors: (i) effects of the changes promoted by Law nº 10,303/2001 (i.e., maximum proportion of common and preferred shares from two thirds to 50%); (ii) in the period between 2004 and 2008, there was a significant volume of initial and subsequent offerings of shares (IPOs) on the Brazilian Stock Exchange (170 companies, of which 71% were admitted to the Novo Mercado, where only shares are traded ordinary); and, (iii) effective implementation of corporate governance levels at Brasil, Bolsa and Balcão, which took place from 2002 onwards.

In sequence, after estimate the historical evolution of control deviation we estimated the descriptive statistics of the constrained firms compared to the unconstrained firms, according to the classification criterion for the financial constraint through the moral hazard of the controlling shareholder (MSCD). Table 2 presents the descriptive statistics of the model variables and also the t tests to verify possible differences between the statistics of constrained and unconstrained companies, and also the Wilcoxon test to verify possible significant differences between the medians of these groups (as we identified that the variables do not have a normal distribution, we performed this test in addition to the t test). Thus, as shown in Table 2, we identified that the restricted firms (bottom) have higher concentration of MSCR and lower MSOR and, consequently, greater MSCD. In relation to the control deviation, constrained firms present, on average, 15,89% of MSCD, while unconstrained firms present 5.56% with 1% of significance.

Table 2
Descriptive statistics (winsorized by 1% in both tails).

Low Moral Hazard – unexpected financial constraints												
	MSCR	MSOR	MSCD	ΔCA	CF	Q	TA(L)	CAPEX	ΔSTD	STD	ΔNWC	AQUI
Mean	57.38	51.96	5.56	0.00	0.07	1.54	16.68	0.06	0.00	0.08	0.00	0.01
Median	53.89	50.28	0.00	0.00	0.06	1.15	16.48	0.00	0.00	0.06	0.00	0.00

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Percentile 10th	20.72	19.25	0.00	-0.05	0.00	0.78	15.50	0.00	-0.03	0.01	0.00	0.00
Percentile 90th	99.9	98.25	24.02	0.06	0.15	2.73	18.04	0.15	0.06	0.16	0.00	0.02
Minimum	3.39	3.23	-15.36	-0.40	-0.35	0.50	14.98	0.00	-0.30	0.00	0.00	0.00
Maximum	100	100	63.07	0.49	0.49	6.07	19.78	0.98	0.32	0.41	0.00	0.20
Standard Error	28.07	27.98	13.28	0.07	0.07	1.09	1.10	0.16	0.06	0.06	0.00	0.02
High Moral Hazard – expected financial constraints												
	MSCR	**MSOR**	**MSCD**	**△CA**	**CF**	**Q**	**TA(L)**	**CAPEX**	**△STD**	**STD**	**△NWC**	**AQUI**
Mean	63.81	47.97	15.89	-0.00	-0.02	1.33	12.38	0.10	-0.01	0.07	0.00	0.01
Median	63.98	44.12	8.37	-0.00	0.05	1.01	12.78	0.00	0.00	0.00	0.00	0.00
Percentile 10th	23.21	15.25	0.00	-0.08	-0.09	0.66	10.23	0.00	-0.05	0.00	-0.06	0.00
Percentile 90th	99.92	96.54	47.31	0.06	0.18	2.34	13.93	0.46	0.03	0.23	0.08	0.02
Minimum	9.00	4.86	-15.36	-0.83	-3.84	0.50	7.24	0.00	-0.29	0.00	-0.41	0.00
Maximum	100	100	63.07	0.49	0.53	6.07	14.86	0.98	0.29	0.56	0.40	0.23
Standard Error	28.53	26.99	19.07	0.12	0.44	0.83	1.65	0.25	0.05	0.11	0.13	0.05
t test	**-4.89*** **	**3.14*** **	**-13.3*** **	**1.96** **	**5.04*** **	**2.78*** **	**64.30*** **	**-4.66*** **	**3.25*** **	**12.9*** **	**-0.36**	**-0.54**
Wilcox. Test	**-4.58*** **	**3.13*** **	**-11.7** **	**3.94*** **	**3.34*** **	**3.47*** **	**37.39*** **	**1.33**	**4.38*** **	**22.8*** **	**-1.86** *	**1.11**

Note: This table presents the descriptive statistics for constrained and unconstrained firms according to the majority shareholder control deviation (MSCD). MSCR are the majority shareholder's control rights; MSOR are the majority shareholder's ownership rights; MSCD is the difference between MSCR and MSOR, △CX is the cash holdings variation; FC is cash flow; Q is the proxy for investment opportunities; TA(L) is the natural logarithm of Total Assets; CAPEX is investment; △STD is the variation of short-term debt; STD is short-term debt; △NWC is the variation in net working capital; AQUI are the acquisitions. t test is the Z Test for Equality of Proportions and the Wilcox Test. is Pearson's measure of association χ2. ***, ** and * denote statistical significance at 1%, 5% and 10%, respectively. **Source**: Elaborated by the authors (2022).

In addition to having greater control deviation, constrained firms have lower generation of cash flow, lower investment opportunities, lower variations in current onerous liabilities, lower short-term debt, lower variation in net working capital and acquisitions practically equivalent to unrestricted firms. Practically all of these relationships (except the last two) show significant differences between the means (*t* test) and medians (Wilcoxon test) at 1%.

Finally, we show, in Table 2, that constrained firms invest more than unconstrained firms, although it is significant only in average terms, the reported result is contrary to what is postulated by theories of access to capital. A possible explanation for this fact is that shareholders have a propensity to spend more funds on projects characterizing an overinvestment, often unprofitable, in order to meet their own benefits (Park et al., 2018).

In addition, we tested the validity of the proposition of the classification criterion by MSCD by means of the analysis of variables related to the ability to obtain credit. This analysis aims to assess how appropriate is the criterion used to split the sample. If the differences are consistent with what is theoretically expected from these groups, we can infer that the proposition of the financial constraint criterion according to the MSCD is adequate.

As expected, we could identify that financially constrained firms (higher MSCD) retain, on average, 12.52% of assets, while unrestricted firms (lower MSCD) retain around 9.13%, the difference being statistically significant at 1%. According to Almeida et al. (2004), financial constrained firms retain more cash, as this will allow the transfer of resources intertemporaly, enabling finance future investments.

Regarding the other variables, we identified that constrained firms, compared to their unconstrained peers, have, on average, lower revenue growth (0.4% < 7.1%), lower asset growth (2.4% < 5%), are less profitable (0.1% < 3.9%), pay less dividends (33% < 47%), use less debt (13% < 41%), use less international debt (10 % < 24%) and have greater volatility of their cash flow (-2.69 > -2.71), all these differences being significant at 1%.

Therefore, regarding the adequacy of the proposition of the criterion for separating firms through deviation, we believed that the differences found between the groups offer empirical support (Almeida et al., 2004).

After estimating the statistic descriptive and as identified in the methodological procedures, we verified the correlation matrix. In Pearson's Correlation, as expected, a strong correlation (above 0.7) is identified between the variables that measure the ownership structure of the majority shareholder, that is, between the control structure and the ownership structure (0.81). The other variables presented low correlation, not indicating multicollinearity.

Table 3
Correlation.

	MSCR	MSOP	MSCD	ΔCX	RETCX	FC	Q	LAT	CAPEX	ΔFINCP	FINCP	ΔNWC
MSOP	**0,81***											
MSCD	0,33*	-0,27*										
ΔCX	-0,00	-0,00	0,00									
RETCX	0,05*	0,10*	-0,06*	-0,34*								
FC	-0,04	-0,07*	0,04	**-0,00**	-0,27*							
Q	0,01	0,02	-0,01	0,08*	0,18*	0,36*						
LAT	-0,10*	-0,03	-0,12*	0,04*	-0,12*	0,29*	0,03					
CAPEX	-0,06*	-0,10*	0,06*	-0,02	-0,08*	-0,04	-0,05	-0,12*				
ΔFINCP	-0,01	0,01	-0,04	0,02	-0,01	0,00	0,04	0,05	-0,01			
FINCP	-0,06	-0,04	-0,04	0,01	-0,14*	0,01	-0,18*	0,08*	-0,21*	-0,21*		
ΔNWC	-0,00	-0,03	0,05*	0,10*	-0,05*	-0,08*	-0,00	-0,01	-0,03*	0,11*	0,07*	
AQUI	-0,06	-0,01	-0,08	0,02	0,00	-0,00	0,13	-0,12*	-0,05	0,02	-0,12*	-0,06

Note: This table presents the Pearson correlations between the variables included in the model (1). MSCR are the majority shareholder's control rights; MSOR are the majority shareholder's ownership rights; MSCD is the difference between MSCR and MSOR; △CX is the change in cash weighted by total assets; RETCX is cash retention over a period weighted per asset unit; CF is the cash flow per unit of total assets; Q is the proxy for investment opportunities; AT is total assets; LAT is the natural logarithm of Total Assets; CAPEX is the asset-weighted investment; △FINCP is the change in short-term financing weighted by assets; FINCP is short-term financing weighted per asset unit; △NWC is the change in asset-weighted net working capital; AQUI: are the total assets weighted cash purchases. For details on the operationalization of these variables, see section 3. * denotes statistical significance at the 1% level. **Source**: Authors (2022).

4.2 Influence of MSCD on financial constraints and robustness check

As pointed out in the methodological procedures, the validity of the results shown in the Table 3 depend on the adequacy of the variables and models to the relaxation of the MQGF assumptions. Initially, the VIF test did not identify multicollinearity between the regressors. By Wooldridge and Breuch Pagan tests, we identified serial autocorrelation in the residuals and the presence of heteroscedasticity, respectively. In order to circumvent these, the estimators were robustly estimated by the Huber White estimator. Afterwards, the model was estimated by the robust Hausman test as well as by the Mundlack test, where, for both, the choice of the random effect model, instead of the fixed effect, was not rejected. Additionally, by the Shapiro-Wilk and Doornik-Hansen tests, the presence of non-normality was verified, however, given the sample size, we believed that the data converge to the population, that is, asymptotically.

Below, the testes mentioned above are compiled.

Table 4
Tests.

Assumption	Test	p-value
Multicolinearity	Variance Inflation Factor (VIF)	1,1400
Heteroscedasticity	Breusch-Pagan / Cook-Weisberg H0: Constant variance	0,0000
Autocorrelation	Wooldridge H0: no first-order autocorrelation	0.0447
Normality	Doornik-Hansen / Shapiro-Wilk W H0: multivariate normality	0,0000
Fixed Effect vs. Random Effects	Hausman H0: random effect	0,0000
Endogeneity	Durbin-Wu-Husman H0: no endogeneity	0,3053

Source: Authors (2022).

In the upper part of Table 5, we showed the regressions of financially constrained and unconstrained firms, following the MSCD, that is, the proxy for the moral hazard of the majority

shareholder. Six regressions were tested in order to elucidate the consistency of the data, building the complete model of constrained (regressions 1 to 3) and unconstrained (regressions 4 to 6) firms. Specifically, were started from a model without sectorial fixed effects (regressions 1 and 4), until its inclusion and differentiation by the short-term financing proxy (regressions 2 and 5) or the variation of short-term financing (regressions 3 and 6).

In general, different behaviors are observed between unrestricted and restricted firms, that is, the moral hazard of the majority shareholder influences the subgroups in a different way, substantially with regard to the cash flow sensitivity of cash. In this analysis, the cash flow sensitivity of cash from unconstrained firms remains non-significant, even after the addition of control variables and cash flow sensitivity of cash flow was positive and significant for constrained firms.

Specifically, in the models related to unconstrained firms (smaller MSCD), the cash holding variation is significantly determined only by investment opportunities and net working capital variation. In this way, the cash flow does not statistically affect the cash holdings variation of unconstrained firms, resulting in a null marginal effect of the cash flow. This result follows the postulate of Almeida et al. (2004) that financially unconstrained firms do not need to protect themselves in a precautionary way.

Alternatively, we evidenced, for constrained firms (greater MSCD), that increases in internal resources have a positive and significant impact (at 1% in regressions 4 and 5 and at 10% in regression 6) on the policy of cash holdings of firms that have difficulties in accessing credit. These estimates suggest that, for each additional dollar of cash flow, a constrained firm saves around R$0.12 or R$0.13 according to models 4 and 5 and R$0.07 according to model 6, while for unrestricted companies, the effect is not significant. This result is consistent with the hypothesis outlined by Almeida et al. (2004) that, faced with credit restrictions, firms save a part for future investments.

Therefore, under the classification of the MSCD, the results suggest that there are differences in behavior between the groups of firms regarding the decision of cash, in a way that is consistent with the propositions by Lin et al. (2011) and Luo et al. (2015). Thus, the differences found can be justified by the fact that the agency problems between the majority shareholders and minority shareholders/creditors increase the propensity to hold cash, given an increase in cash flow, generating more financial constraints. These results lead to the non-rejection of the previously defined hypothesis H0.

In general, the exposed result is in line with the studies by Lin et al. (2011), by Luo et al. (2015), by Rêgo (2016) and Park et al., (2018) illustrating the theoretical argument that the incipience of the capital market, as well as the weak protection for minority shareholders, implies that the high moral risk of the controlling shareholder negatively signals to foreign investors that their assets may be expropriated, leading to financial constraint. These factors, taken together, likely reduce investors' willingness to provide funds and increase the costs associated with external financing and the guarantees required to grant loans to companies that have high equity deviations.

Table 5
Robust OLS regressions with fixed effects.

	Unconstrained Irrestritas\			Constrained				Complete Sample			
ΔCA	**1**	**2**	**3**	**4**	**5**	**6**	**ΔCA**	**7**	**8**	**9**	**10**
Q	**0.01*** **	**0.01*** **	**0.01** **	0.00	0.00	0.00	**MSCD**	**0.19*** **		**0.06*** **	**0.04** **
	(2.99)	(2.86)	(1.92)	(0.18)	(0.57)	(1.23)		(3.77)		(2.88)	(2.06)
CF	-0.01	-0.01	0.02	**0.13*** **	**0.12*** **	**0.07***	**MSCD *CF**			**0.23*** **	
	(-0.26)	(-0.17)	(0.22)	(3.59)	(3.36)	(1.68)				(3.24)	
TA(L)	-0.00	-0.00	-0.00	0.00	0.00	0.00	**MSCD (t-1)**		**0.22*** **		
	(-0.51)	(-0.55)	(-0.27)	(1.21)	(0.28)	(0.53)			(3.75)		
CAPEX	**-0.03*** **	**-0.03*** **	-0.03	**-0.02***	**-0.02***	**-0.03***	**MSCD*CF (t-1)**				**0.29*** **
	(-2.87)	(-2.83)	(-1.33)	(-1.64)	(-1.74)	(-1.64)					(3.10)
ΔSTD	0.05	0.04		-0.03	-0.05		**Q**	**0.01***	**0.01***	0.00	0.01

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	(1.01)	(0.84)		(-0.72)	(-1.04)			(1.72)	(1.71)	(0.09)	(0.12)
STD			0.05			**-0.07***	**AT(L)**	**0.03*** **	**0.03*** **	**0.03**	**2.06*** **
			(0.37)			(0.10)		(3.57)	(3.14)	(2.57)	(2.44)
△NWC	**-0.2*** **	**-0.22*** **	0.37	**0.33*** **	**0.33*** **	**0.26*** **	**CAPEX**	**-0.21***	**-0.21***	**-0.26***	**-0.25***
	(0.02)	**(0.01)**	(0.86)	(0.00)	(5.20)	(0.00)		(-1.77)	(-1.76)	(-1.86)	(-1.85)
AQUI	-0.04	-0.09	-0.016	-0.08	-0.05	-0.18	**△STD**	**-0.13***	-0.12	**-0.13***	**-0.12***
	(-0.33)	(-0.43)	(-0.08)	(-0.73)	(-0.27)	(-0.90)		(-1.69)	(-1.45)	(-1.77)	(-1.65)
Constant	0.04	0.03	0.03	-0.014	-0.01	-0.03	**△NWC**	0.20	0.21	0.82	0.28
	0.74	0.67	0.26	-0.54	-0.54	-0.79		(0.57)	(0.53)	(1.18)	(0.44)
							AQUI	**-0.30***	-0.25	**-0.27***	**-0.3** **
								(-1.81)	(-1.41)	(-2.01)	(-2.22)
							Constant	**-0.39*** **	**-0.36*** **	**-0.32** **	**-0.30***
								(-2.99)	(-2.59)	(-2.04)	(-1.90)
IFE and TFE	No	Yes	Yes	No	Yes	Yes		Yes	Yes	Yes	Yes
Adjusted R2	0.18	0.19	0.29	0.25	0.25	0.27		0.33	0.12	0.25	0.22

Note: The dependent variable is the cash holdings variantion (△CA). The explanatory variables are: Cash flow (CF); Majority Shareholder Control Deviation (MSCD), Interaction between MSCD and CF (MSCD*FC); MSCD lagged (MSCD (t-1)); Interaction between MSCD and lagged CF (MSCD*FCF (t-1)); Investment Opportunities (Tobin's Q); Natural Logarithm of Total Assets (AT(L)); Investment (CAPEX); Variation in short-term debt (△STD); Short-term debt (STD); Variation in net working capital (△NWC); Acquisitions (AQUI). t-statistics in parentheses, ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. IFE (TFE) = industrial (temporal) fixed effects. **Source:** Elaborated by the authors (2022).

Therefore, the main implication of this result is that the companies with greater control deviations (financially constrained) propose to capture external resources to realize valuable investment opportunities, potential capital holders take into account the moral hazard of the controlling shareholder, influencing the dissimilarity between external financing and internal, making cash sensitive to increases in the availability of internal resources (Almeida & Wolfenzon, 2006; Luo et al., 2015).

Regarding investment opportunities (Tobin's Q) we evidenced, for unrestricted firms, that they positive and significantly influence the cash holding variation. Almeida et al. (2004) report that only financially constrained firms should demonstrate cash sensitivity to investment opportunities, differing from the exposed result. The results can be understood as a sign of underdevelopment, due to the high inflation rates as well as the high interest rate of the Brazilian capital market, when compared to the North American scenario, which may affect even more cash levels (Manoel, 2016). Constrained firms also showed investment opportunities sensitivity to cash, following the results of Almeida et al. (2004).

As for investments, we found that they reduce the cash variation for constrained firms, with a magnitude very close to unconstrained firms. Almeida et al. (2004) identified that both constrained firms (size criterion) and unconstrained firms (commercial paper criterion) have investment sensitivity of cash, but with a greater magnitude for constrained one.

In relation to the variation of net working capital, we evidenced a different behavior, according to the credit situation of Brazilian firms. In unconstrained firms, there was a negative net working capital sensitivity of cash, following the precepts of Almeida et al. (2004). However, in the case of constrained firms, variations in net working capital increase its sensitivity of cash, contrary to Almeida et al. (2004), who found a negative relationship between the variables for constrained firms, but with their coefficients statistically equal to zero.

The other controls, that is, the size, variation of short-term debt and acquisitions, did not impact cash flow sensitivity of cash for both unconstrained and constrained firms, except in regression 6, which signaled that the short-term debt negatively influences this variable, following the precepts of the literature (Almeida et al., 2004).

In addition, we tested the argument of Dasgupta et al. (2011) that the lagged cash flow (t -1) also influences the change in current cash (t). The results were similar, but with better adjustment and an increase in the degree of explanation of the models for credit-constrained firms ($R2$ adjusted). This question is in accordance with the argument by Dasgupta et al. (2011) that cash sensitivity does not only affect the variables contemporaneously. For summary reasons the table has been suppressed.

Additionally, in order to give robustness to the results, the present study sought to reinforce the results previously shown that the moral hazard of the majority shareholder results in financial constraints. Thus, instead of using the MSCD as a criterion for classification between constrained and unconstrained firms (methodology commonly used in the credit constraint literature), were sought to use the MSCD, as well as its interaction with the cash flow, as explanatory of the model and to capture its effect on the sensitivity of the cash directly.

In general, through Table 3, it was verified that the MSCD (both in t and in t-1) positively influences the cash policy, with this relationship being significant at 1% (regressions 7, 8 and 9) and at 5% (regression 10). Cash sensitivity estimates indicate that, for each percentage increase in the MSCD, a firm saves between 0.04 and 0.22 percentage points more in cash holdings.

Furthermore, models 9 and 10 aggregate the interaction between the MSCD with the cash flow and its lags, respectively. The purpose of this analysis was to verify whether the increase in cash holdings (models 1 to 6) occurs due to internally generated resources (i.e. $\beta_2 + \beta_3\ x\ CF$), characterizing a scenario of financial constraint.

In general, we showed that the increase in the MSCD causes firms to hold cash from the cash flow, that is, when there are greater control deviation, the propensity to hold cash from the cash flow increase (constrained firm behavior) (Almeida et al., 2004). Again, we estimated the impact of the lagged cash flow, now interacting with the MSCD in model 10. We demonstrate that the increase in the MSCD causes firms to hold cash from cash flow in the short-term.

The other variables follow the relationships postulated by the theories, as well as the relationships highlighted previously. Thus, cash holding is negatively sensitive to investment opportunities (Tobin's Q), investments, changes in short-term financing and cash acquisitions. In addition, cash holding is positively sensitive to changes in net working capital.

5 CONCLUSIONS

The present study aimed to analyze whether the moral hazard of the majority shareholder results in financial constraints on Brazilian firms listed on B3. For this purpose, the cash flow sensitivity of cash of firms that have high MSCD, characterizing high moral hazard (constrained firms) and low moral hazard (unconstrained firms). Thus, this article sought to explain financial constraints through the agency conflict between the majority shareholder and sources of credit, represented by the deviation from the 'one share, one vote' rule.

Our first result is from the descriptive statistics. We identified that, in historical terms, the control deviation declined significantly and, probably, some reasons to that is the effects of the changes promoted by Law nº 10,303/2001 (i.e., maximum proportion of common and preferred shares from two thirds to 50%) and the implementation of corporate governance levels at Brasil, Bolsa and Balcão, which took place from 2002 onwards (i.e. control deviation equal zero to the 'Novo Mercado'). This result implies that the government and the Securities and Exchange Commission (CVM) have sought legal mechanisms to increase investor confidence in companies, that is, mechanisms to protect them. In the present context, segments such as the 'Novo Mercado' require that the company, when making its Initial Public Offering (IPO), only have common shares, meaning that the controlling shareholder, for example, has no difference between its ownership structure (cash flow rights) and its control structure (control rights) signaling to the investor lower propensities to expropriate them.

In the regressions, a different behavior was evidenced between the unconstrained firms (lower MSCD) in relation to the constrained firms (greater MSCD), that is, that the moral hazard of the

majority shareholder influences the subgroups differently, mainly with regard to the cash flow sensitivity of cash (Almeida et al., 2004). The results also corroborate with Lin et al. (2011) and Luo et al. (2015), indicating that the moral hazard of the majority shareholder is an resulting in factor of financial constraint, culminating in the non-rejection of H1.

The differences found are justified by the fact that, due to the excess of shareholder control rights, agency conflicts worsen, which can send a negative signal to external minority investors and creditors that their assets may be expropriated, resulting in financial constraints (Park et al., 2018). In this sense, the moral hazard of the majority shareholder is characterized by the diversion of resources from the firm, transferring or committing funds to projects that produce private benefits. Consequently, foreign investors, anticipating the potential for expropriation of the majority shareholder, will be less willing to invest in these companies because they face the risk of not getting a return on their investment (Luo et al., 2015).

This study presents theoretical and empirical contributions. Theoretically, the present research contributes to the studies on the financial consequences of the moral hazard of the controlling shareholder bringing the argument that the moral hazard problem leads to financing constraints in the Brazilian scenario. In this context, this study provides evidence on how firms' financial constraints are affected by different moral hazard levels.

This is possible because we used the moral hazard of controlling shareholder like a proxy, ex ante, to identify expected propensity of financial constraints. This result raises a possible practice implication that in addition to efforts by the government and the CVM to seek and create mechanisms for the highest levels of governance (e.g. 'Novo Mercado'), it is also necessary to create more efficient mechanisms for the governance segments that are fragile from an investor protection point of view (e.g. Traditional Level). The purpose of this is to be able to mitigate the effect of control deviation on the creation of possible financial constraints.

Empirically, an innovation of our study is the use of moral hazard of controlling shareholder like our proxy of expected propensity of financial constraints that can reflect the Brazilian scenario on this classification aggregating value on the analysis. Then, the proposition of the MSCD as a proxy of financial constraint makes possible to continue the research, as there are major impasses in the definition of what characterizes a financial constraint. Therefore, the validity of this proposition lies in the fact that the shareholder deviation from control (escape from the "one share, one vote" rule) reflects the moral hazard of the majority shareholder, the weak legal protection for minority shareholders (civil law), the incipience of corporate governance, as well as the embryonic degree of financial development of the Brazilian capital market, in which, according to La Porta et al. (2000), are aggravating credit restrictions. Thus, the use of equity deviation as a way of classifying financial restrictions differs from the classic forms, contributing to advances in research involving financial restrictions, especially for the Brazilian context, since until then there are no other works that address such use.

In this sense, the study of the impact of the majority shareholder's moral hazard on the companies' difficulty in accessing credit can reveal new types of sources of financial restriction, evidencing an idiosyncrasy of the Brazilian financial market as well as reflecting, in a particular way, the possible financial restrictions in Brazilian institutions. As a limitation of the study, we do not differ the ownership structures where the majority shareholder is a legal person. The consideration of this would entail the need to calculate the shareholding deviation through pyramidal structures, in which they can be extended at different levels. Finally, as a suggestion for future work, there is the possibility of carrying out the study at the country level, thus comparing how the different levels of financial development, legal origin and corporate governance, potentiate/mitigate the influence of the deviation of shares from the main controlling shareholder.

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Endereço dos Autores:

Avenida Roraima, nº 1000, Prédio 74C,
Santa Maria – Rio Grande do Sul - Brasil
97105000